

What is claimed is:

1. A method of impairing a hematologic cancer progenitor cell comprising contacting said cell with a compound that selectively binds to CD123 in an amount effective to cause impairment of said cell.
2. The method of claim 1, wherein said compound comprises an antibody.
3. The method of claim 2, wherein said compound further comprises a cytotoxic agent.
4. The method of claim 3, wherein said cytotoxic agent is a radioisotope.
5. The method of claim 4, wherein said radioisotope is selected from the group consisting of  $^{211}\text{Astatine}$  and  $^{131}\text{Iodine}$ .
6. The method of claim 1, wherein said impairment is cell death.
7. The method of claim 1, wherein said hematologic cancer is leukemia or malignant lymphoproliferative disorders.
8. The method according to claim 7, wherein said leukemia is selected from the group consisting of acute myelogenous leukemia, chronic myelogenous leukemia, myelodysplastic syndrome, acute lymphoid leukemia, chronic lymphoid leukemia, and myelodysplastic syndrome.
9. The method according to claim 7, wherein said malignant lymphoproliferative disorder is lymphoma.
10. The method according to claim 9, wherein said lymphoma is selected from the group consisting of multiple myeloma, non-Hodgkin's lymphoma, Burkitt's lymphoma, and follicular lymphoma (small cell and large cell).
11. A compound that binds selectively to CD123 and impairs hematologic cancer progenitor cells.

12. The compound of claim 11, wherein said compound comprises an antibody.
13. The compound of claim 12, wherein said compound further comprises a cytotoxic agent.
14. The compound of claim 13, wherein said cytotoxic agent is a radioisotope.
15. The compound of claim 14, wherein said radioisotope is selected from the group consisting of  $^{211}\text{Astatine}$  and  $^{131}\text{Iodine}$ .
16. An assay for detecting the presence of hematologic cancer progenitor cells in a sample, comprising detecting the presence of CD123 in said sample.
17. The assay of claim 16, wherein the presence of CD123 is detected by introducing a compound that selectively binds to CD123 and determining whether the compound binds to a component of said sample.